The Black Dragon Solar Solstice Markers and Calendar

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Abstract

The Black Dragon pictograph site near Green River, Utah, has two styles of paintings: a Barrier Canyon pictograph panel, and a second panel with a number of cryptic line drawings and dots. On the latter panel some of the pictographs can be interpreted as clues to the solar position for the summer and winter solstices, when on those dates the sun's rays interact with physical features in the vicinity of the site. Also, there are a number of pictographs consisting of arrangements of dots. One of those pictographs, consisting of six rows of sixty dots, probably represents an annual calendar.

Introduction

After the URARA Labor Day symposium of 1995 one of the side trips my wife, Virginia (Allee), and I took was to the Black Dragon pictograph site, about 15 miles WSW of Green River, Utah, in a canyon of the San Rafael Reef. While there, and looking west up the Black Dragon canyon, it was noted that the dominant peak had a compass bearing of about 300° (corrected for magnetic deviation). At sunset a peak at this bearing on the horizon would mark the solar sunset position of the summer solstice (1). At that time a telephoto photograph of the peak was taken. It was at a distance of about two miles (3-4 km). Later when the picture was viewed, it was noted that the mountain peak site fulfills the criteria that a pictograph site may sometimes be chosen because of certain features on a cliff (2). Only in this case, the feature is remote from the pictograph site. The domed appearance of the mountain has cliff features below that are columnar. The effect is that it could be viewed as representing a cumulus cloud with a rain shower from its lower level. Such symbols are sometimes a criteria for the location of pictograph panels (2).

When going north upstream in the Black Dragon canyon about a half mile from the canyon entrance, the canyon makes a sharp turn to the west at the pictograph site. Just before the

canyon wall turns, the cryptic line drawings and dots are found on the right, the east wall of the canyon. The Barrier Canyon style pictographs are on the same side of the canyon wall, just beyond the turn on the north wall of the canyon.

Also, germane to this study is a nearby cave formed when a portion of a cliff above an alcove-type recession into the cliff fell in such a manner that the resultant scree left a "cave" between the scree and what was originally the top of the alcove. The cave is not visible from below, the scree being of such a height that the opening is screened from the view of an observer on the canyon floor.

Pictograph Analyses

The Black Dragon Pictograph Panel

On the north wall of the canyon at the pictograph site are several Barrier Canyon style pictographs. It has been noted (2) that many such pictographs are located where water may run, or appeared to have run, from within the cliff. There the artists painted their pictographs as invocations to the rain spirits within to assure water for their crops. The north panel is located near such a vertical crack in the cliff that may have been the source of apparent water flow from the cliff on occasion.

The panel and canyon have been named after one of the pictographs on that panel. The large surrealistic style "Black Dragon" painting has been identified as a flying-eared grebe, a crested water fowl with legs far back on the body that ranges and breeds in the area during the summer. This Black Dragon pictograph may have been an invocation to the spirit of the grebes to bring water to areas where the grebe was hunted.

The Cryptic Lines Drawings and Dots

Figure 1 is derived from the telephoto picture of the mountain peak on the western horizon. The accented heavy lines are the peak and columnar cliff below. The upper line of the sketch is the distant mountain skyline, the lower line is that of the nearby cliffs and scree that obscure the lower levels of the distant mountains.

A field trip to the Black Dragon site was made on the date of the summer solstice of 1996 to view the sunset from the site of the pictograph panel. It was a disappointment to see that the sun did not set directly on the top of the mountain peak. The sun's path was that taken by the

arrow on Figure 1, and the sun set on the flank of the peak. The arrow's directional path was derived from a table of solar azimuth, elevation and time for the summer solstice at a north latitude of 38^{o}.

However, with a last look at the left, or north end of pictograph panel, it was a thrill to discover the pictograph of the distant mountain. (See Figure 2.) It had a feathered feature with eleven barbs on each side that indicated the brilliant path of the sun just before it set behind the peak. The feathered shaft is red, the barbs were alternately red and black pigment with red barbs at the ends. The point at which the shaft of light would intersect the representation of the mountain peak was on the lower left flank of the peak!

If the outline of the mountain and arrow of Figure 1 is superimposed on the representation of the pictograph drawing of Figure 2, perhaps the artist of long ago made his angle of the path of the sun denoted by the feathered feature coincide within a very few degrees of the actual sun's path drawn on Figure 1.

On Figure 2, it can be noted that the artist used lines radiating from and in an upper direction above the mountain peak, probably denoting that immediately after the sun sets behind the mountain peak there is a strong afterglow of sunlight to be seen in the sky above the peak.

On Figure 2, the mountain peak is represented as it appears on the horizon, and has the rounded appearance of an inverted "U." Next to this diagram is an upright "U." This could be interpreted as a representation of the cave at the top of the scree on the north wall of the canyon. Dick Seely observed that only at the time of the winter solstice does the light of the sun penetrate the cave to its inner recesses.

The cave is represented by three lines. A red inner line represents the sunlight illuminating the interior of the cave. A middle black line represents the cave. A red outer line may represent the spiritual power residing within the cliff behind the cave walls.

Just above the cave symbol, Figure 2, is a red-pigment line drawing interpreted as the ray of sunlight that enters the cave on the winter solstice. The perpendicular barbs on the shaft of the direction line would represent the brilliance of the sun's rays. The depictions of the sun's rays in the two pictographs indicate that the artists were aware of the solar timing markers of the summer and winter solstices.

Figure 2 also shows the series of dots found in close proximity to the solar marker

pictographs. There are six rows of sixty dots probably representing an annual calendar. The top row is black pigment, the next four rows are red pigment, and the bottom row is black pigment. If one picks any corner of the calendar and proceeds through the sequence of dots line-by-line, there are 60 black dots, then 240 red dots, and finally 60 black dots. The colors of the progression suggest that if the corner dot is a winter solstice, the black dots represent the remaining cold and uncomfortable two winter-weather months. The red dots represent a season of warm, delightful, summer-like weather followed by another two uncomfortable months before the return of the winter solstice.

Moving to the right along the pictograph panel, there are many interpretative variations of the mountain peak, cave, rays of sunlight, and assemblages of dots. Other assemblages of dots appear to have an easily discerned solar, lunar, or celestial time frame to account for their origin. There are several representations of the solar disk.

Very few pictographs represent animals, the most prominent are what appear to be bear paw tracks, "killed" by petroglyphs (4) to send the power of the pictographs as invocations to the spirits of bears. One panel of bird tracks is in and partially circumscribing one of the mountain peak symbols-purpose unknown.

An interesting feature is a small hole, less than one inch in diameter, maybe natural, possibly drilled into the rock wall of the panel. It is surrounded by a small white disk. This might be a gnomon device to determine a specific day during the year. On one or two days during the year, when the sun was directly in line with the stick inserted into the hole, the stick will not cast a shadow on the painted disk. A measurement of the azimuth and the angle of elevation of the stick would determine from solar position tables the specific day(s) no shadow could be cast on the painted disk.

The panel features discussed above are located underneath, and have been protected from weathering by a shallow-arched overhang of the cliff. There are other pictographs on the canyon wall to the south of the arched overhang, but exposure to weathering has made any interpretation of their meanings virtually impossible. The panel extends south along the canyon wall only as far as the sacred mountain peak on the western horizon remains visible (4).

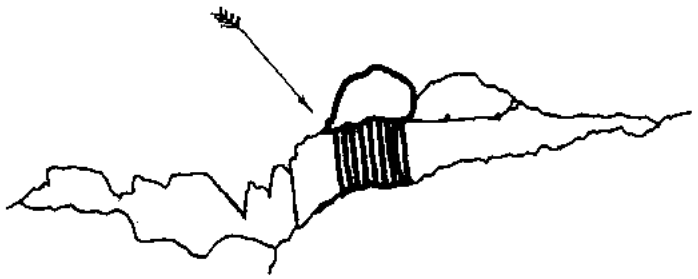

Figure 1. Skyline west of the Black Dragon pictograph site. The arrow represents the path of the sun as it sets behind a western horizon mountain peak at the time of the summer solstice.

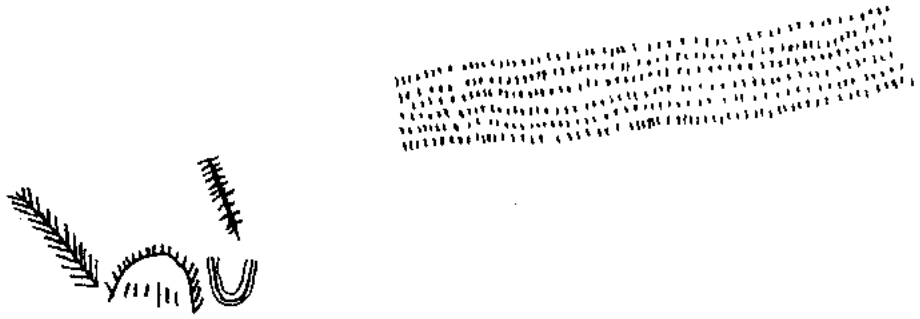

Figure 2. The pictograph panel. On the left is a representation of the sun's path setting behind the western horizon mountain peak of Figure 1 at the time of the summer solstice. To the immediate right is a representation of a nearby cave with a sun's ray shining into it at the time of the winter solstice. In the upper right hand corner is what we believe to be a calendar, with six rows of sixty dots.

Conclusion

The east wall of the canyon at the Black Dragon site appears to be mainly concerned with solar movement in relationship to nearby natural features, such as marking the summer and winter solstices, forecasting the seasons, and possibly the timing of certain rituals. In a sense, the east wall of the Black Dragon site could be described as being the site of a solar observatory.

The horizon art work at this site depicting the sun setting behind a mountain peak is a direct solar marker. Solar markers placed to interact with light and shadow have been defined as indirect solar markers. Examples of this are the usual type of solar marker found on pictograph panels (2).

There is another type of solar marker that has yet to be defined and is typified by the cave symbol at the Black Dragon site. This is an example of rock art placed and described in a nearby site where there is a solar interaction with a natural feature, but is not directly visible from the rock art site. It is suggested that this type of solar marker be classified as a *hidden direct* solar marker, or a *crypto direct* solar marker.

Acknowledgment

Nal Morris, leader of a 1995 URARA Labor Day symposium field trip to the Parowan Gap near Cedar City, UT, interpreted the art work and located sites from whence the sun setting through the Parowan Gap defined solar markers for the solstices and equinoxes. Sharing that knowledge with members of the URARA has enabled others to gain understanding and extend that knowledge to other sites.

Bibliography

1. Fountain, J. "Solar time, elevation, azimuth for the summer solstice, winter solstice, the equinoxes for 36^{o} and 38^{o} north latitude."

2. Allee, P. "The Barrier Canyon style pictographs: WHY, WHERE, WHAT, and WHEN they were painted." Paper presented at the Fifteenth Annual Symposium, Utah Rock Art Research Association. September 1995.

3. Allee, P. "Invocations to the Gods: the Southeastern Utah Fremont Pictographs." Paper presented at the Twelfth Annual Symposium, Utah Rock Art Research Association. September 1992, pp. 119-186.